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ABSTRACT

The Institute of Food and Agricultural Sciences (IFAS) at the University of Florida formed a task force in mid-1995 to develop a comprehensive plan for using distance education in the next century. A questionnaire was sent to department chairs and research center directors at the university (59 responses) requesting information on how they would use distance education in administration, extension, research, and teaching. The respondents selected full-credit courses and extension workshops as the most likely uses for distance education. They also suggested that they would need assistance in using technology. The task force recommended focus on the following areas: (1) forming a distance education committee; (2) prioritizing a course and program offerings; (3) developing a support structure; (4) designing methods for faculty incentives to develop distance education programming; (5) developing distance learning materials; (6) maintaining and developing technological and personnel infrastructure; (7) developing a training program; (8) establishing a marketing plan; and (9) developing distance education linkages with other colleges at the University of Florida, state and federal agencies, and businesses. (Four appendixes describe available distance education technologies, list IFAS programs delivered via satellite and videotape, and include the task force questionnaire and tables of results. The report includes 20 references.) (KC)

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College of Agriculture
Florida Cooperative Extension Service
Institute of Food and Agricultural Sciences
University of Florida
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October 1996

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University of Florida's
Institute of Food & Agricultural Sciences'
Distance Education Task Force

Final Report

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October 1996

Table of Contents

Section	Page
Table of Contents	i
Introduction	1
Distance Education Background	2
Advantages	4
Disadvantages of and Barriers to Distance Education	4
Distance Education Task Force Charges	5
Survey Results of IFAS Teaching, Extension, Research & Administrative Activities	6
Function, Audience, and Program Offerings	6
Faculty Educational and Support Needs	7
Technological Tools or Media	7
Distance Education Task Force Recommendations	8
Distance Education Committee	8
Prioritize Course and Program Offerings	9
Support Structure	11
Faculty Incentives	12
Distance Education Materials	12
Technology	14
Personnel Responsibilities	17
Faculty and Staff Training	18
Marketing	19
Linkages with Other Entities	20
Closing Statement	21
Appendix A: Available Distance Education Technologies	22
Appendix B: IFAS Programs Delivered Via Satellite and/or Videotape	25
Appendix C: Distance Education Questionnaire Distributed to IFAS Department Chairs and Research and Education Center Directors	26
Appendix D: Tables from Survey of IFAS Teaching, Extension, Research, and Administrative Activities	27
Appendix E: UF/IFAS Satellite Downlink Sites	30
References	31

University of Florida's Institute of Food and Agricultural Sciences' Distance Education Task Force Report

INTRODUCTION

Educating students at a distance has been a major component of many universities' educational programs for decades (Shale & Garrison, 1990). Rooted in correspondence education, distance education has taken on a new flavor in recent years. With the incorporation of new communication technologies, such as satellites, compressed video, and computers, distance education is being used by an increasing number of schools, colleges, and universities. Moreover, this phenomenon transcends national boundaries, and, to a remarkable extent, it is a truly international event (DeLoughry, 1988; Shale & Garrison, 1990). In many developing nations, distance education already has become integral for the instruction of students (Gokdag, 1994; Kerr, 1982; Murphy, 1989; Sostmann, 1994). The International Council for Distance Education estimates that 10 million students worldwide take degree courses by some form of distance education (Kaye, 1988).

Distance education is widespread around the world, but it also has many and varied applications here in the state of Florida. One organization already involved in distance education is the University of Florida's Institute of Food and Agricultural Sciences (IFAS). This report details how IFAS can incorporate distance education into its existing and projected programs, courses and activities.

The use of distance education systems would enable IFAS to be more successful in accomplishing its mission of making knowledge in food, agricultural, human and natural resources accessible to all Florida residents. In the form of extension programs, distance education has been a part of what IFAS has done for decades. But through the use of new technologies, faculty can now reach a more widely dispersed audience with the same effort -- or less effort -- than if faculty had to drive to many sites to give the same presentation. The "traveling professor" or "traveling specialist" has provided off-campus instruction throughout the state for many years. It must be stressed that the educational program or activity should drive the technology, not the other way around. Technology is an educational tool, not an end in itself, and this *tool* can provide learning opportunities to wide-ranging and diverse audiences when used in support of educational initiatives. (See Appendix A for listing of particular technologies and their benefits.)

An IFAS College of Agriculture Task Force on Off-campus Instructional Programs issued a report supporting technology as an acceptable mode of providing formal instruction to distance learners (Cheek, Arnold, Bachman, Bolton, Cole, Emino, Poucher, & Shoup, 1993). For IFAS to make use of instructional technologies to reach these audiences, IFAS should clearly articulate its vision for developing distance education programming. A clear vision for distance education will enable IFAS to relate program outcomes to stakeholders, to understand and meet learners' needs,

to analyze competitors and engage collaborators, and to use a multimedium approach in distance and "traditional" education.

This vision also must include academic programs, extension, administrative activities, and research. Academic programs would entail the delivery and facilitation of courses to off-campus sites, such as IFAS's remote satellite campuses at Ft. Lauderdale, Immokalee, and Milton. Distance education could allow extension activities -- recertification and training programs -- to take place over great distances. Administrators could use distance education for meetings and interviews, and researchers could collaborate with colleagues and report their findings easily with distance education. However, most importantly, while IFAS programs can benefit from this technology, this vision must place the learner/user **first** in the delivery of distance education. The centrality of the learner is a hallmark of effective distance education; therefore, the vision must not lose sight of the learner.

DISTANCE EDUCATION BACKGROUND

Distance education is not a new phenomenon. Distance education, in the form of correspondence education, dates to the 1850s in Europe (Sherow & Wedemeyer, 1990). It was adopted in the 1870s in the United States (Verduin & Clark, 1991). The American distance education model has grown past strictly printed correspondence education to include educational material disseminated via various technologies, including radio, computer, videotape and television. Integrating various technologies, instead of relying on just one delivery system, is characteristic of a distance education framework (Levine & Doyle, 1994; Murphy, 1992).

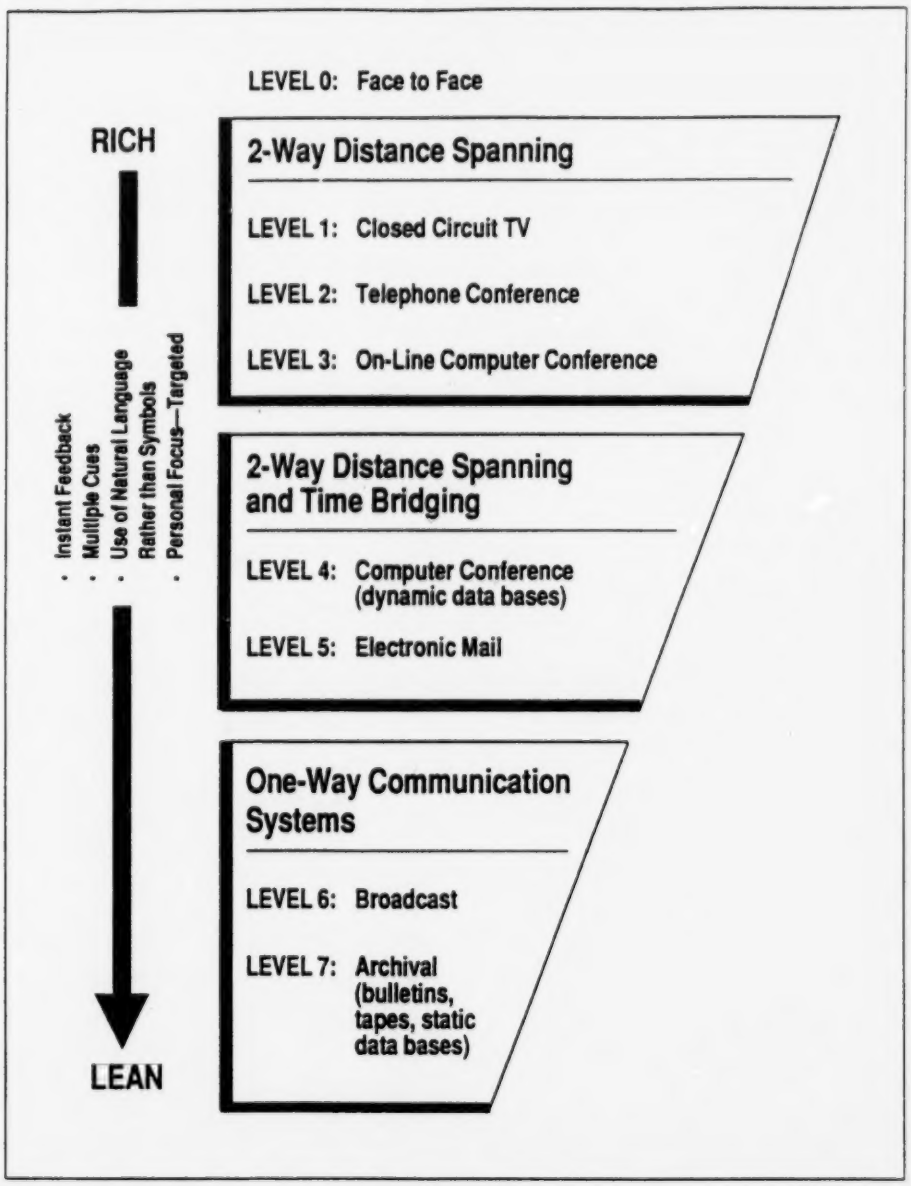
For the purposes of this report, *distance education* is defined as two-way communication between teacher and student(s) separated by a geographical distance and/or time, where the communication is mediated by technology to support the educational process. Given these characteristics, communication does **not** have to occur in "real time." Distance education allows educators to move information to the people, rather than move people to the information.

Already, more than 80 colleges and universities nationwide offer degree programs at the bachelor's, master's or doctorate level that require a short or **no** residency requirement (Thorson, 1989). In Florida alone, four universities offer some type of degree program for nonresident students (Thorson, 1989). Therefore, competition is a driving force in the use of distance education.

The case for distance education is also underscored by Twigg and her discussion of *The Need for a National Learning Infrastructure* (1994). While in some cases, traditional fixed time/space models may be acceptable, Twigg contends that such systems do not necessarily focus on the needs of the learner. Twigg makes a strong case for increased access, improved quality, and reduced costs. It must be noted that costs are reduced over a period of time, but start-up costs can be expensive.

The effectiveness of learning systems is based in part on the richness of teacher/student interactivity. Those systems with high interactivity are generally more effective and facilitate learning better than those with low or no interactivity. It is possible to construct a richness scale ranging from no interactivity between teacher and learner such as printed material or textbooks, to full face-to-face interaction in the classroom. Such a richness hierarchy was illustrated in the 1991 *F.A.C.T. (Future Application of Communications Technology)* report by ECOP and ES-USDA. The chart (Figure 1) combines McGrath's classification of communications technology with Daft's classification of these technologies according to a "richness hierarchy."

Figure 1
Classification of Information Technology "Richness Hierarchy"


LEVEL 0: Face to Face
RICH
2-Way Distance Spanning
LEVEL 1: Closed Circuit TV
LEVEL 2: Telephone Conference
LEVEL 3: On-Line Computer Conference
• Instant Feedback
• Multiple Cues
• Use of Natural Language
Rather than Symbols
• Personal Focus—Targeted
2-Way Distance Spanning and Time Bridging
LEVEL 4: Computer Conference (dynamic data bases)
LEVEL 5: Electronic Mail
One-Way Communication Systems
LEVEL 6: Broadcast
LEVEL 7: Archival (bulletins, tapes, static data bases)
LEAN

Distance education offers several advantages over "traditional" classroom teaching. Some of these advantages are briefly outlined below.

Advantages

Costs -- After initial hardware purchases, it is relatively simple to maintain and to justify costs. In businesses and institutions where people from sites around the state or country travel to a central location for meetings, they can cut their travel budget tremendously with a distance education system.

Travel time -- A person doesn't have to be on the road to conduct a meeting, classes, or other educational/instructional activities. Instead of driving four hours to a one-hour meeting or class and then driving back four hours, a person can link via distance education technologies immediately and save the eight hours on the road.

Effectiveness -- Studies have shown that students learn as well or better in a distance education situation than in a "traditional" classroom set-up (Chu & Schramm, 1975; Whittington, 1987). The reasons for this result are varied. Students perform tasks at their own pace; the classes fit into their schedule; and these students usually are more motivated -- the distance learner **wants** this information.

"Reach" -- Distance education allows teachers to reach students outside the Gainesville area. This "reach" can stretch across Florida, the United States, or the world. Also, the "reach" extends to special guest speakers who can be brought in electronically from around the state, country, or globe with distance education technologies.

Improved teaching materials -- The materials that teachers develop for distance education purposes are usually better than those that they would design for a traditional "face-to-face" classroom. Examples of improved materials are videotapes, computer programs/applications, detailed hand-outs, and computer graphics.

Better structured learning environment -- Along with the improved teaching materials, professors have stressed that their teaching methods have become better as a result of providing instruction via distance education (Dillon & Walsh, 1992). Teachers say that distance education forces them -- in a positive sense -- to focus on what's important in their instructional design and presentations.

Education on demand -- Students can access learning situations at their own convenience, according to their individual schedules and needs rather than having to conform to the schedules or needs of the educational institution or the faculty.

Disadvantages of and barriers to distance education

Teaching by distance education technologies also has disadvantages. Following are a few that must be considered.

Impersonal -- Interaction seems stilted. It is not "really" face to face. However, lecturing to 100 or more students can find face-to-face interaction to be just as lacking. But who needs the interaction? In several studies on interactivity, students don't seem to mind not having an instructor "physically" around. Instructors, on the other hand, overwhelmingly want a class of

warm bodies so they can gauge how well they are doing by seeing students' faces. So according to the studies, teachers need the *face-to-face* interaction, not necessarily the students. Furthermore, distance education technologies can actually increase teacher/student interactivity through electronic bulletin boards, group postings of comments, "chat" modes, and special student service menus.

Costs -- Just as this is an advantage, it is also a disadvantage because the start-up costs are quite high, but, in many instances, prices are coming down.

"Up-front" time -- Distance education requires a great deal of time from teachers to prepare for their classes. Some estimates range from one hour to three hours of more preparation time needed for each hour of coursework disseminated via distance education technology.

Misunderstood -- Many people, including some state legislators, are touting distance education as the "panacea" -- the "cure-all" -- for higher education, but it is not. Not every communication need can be met with distance education.

"What's in it for me?" -- Dillon and Walsh's (1992) research shows that faculty members' motivation for teaching at a distance results from **intrinsic** (self-motivated) rather than **extrinsic** incentives. Faculty perceive that distance teaching is neither "rewarded by their academic departments nor perceived as a scholarly activity by significant colleagues" (p. 16). Full professors tend to be more satisfied with their distance teaching experience than teachers at lower ranks, perhaps because of the positive effects of impunity from institutional reward systems. This failure in the academic culture must be addressed on a local and national scale.

Institutional and administrative barriers -- Although many administrators recognize that distance education is becoming an important technological development that will affect culture and society, a general lack of understanding of the technology is leading to excessive caution in its adoption and a lack of assigned resources to this development. Thus, the mechanisms that will provide credit to tenure-track faculty for the level of work involved in learning and developing the new technologies need to be addressed. In addition, mechanisms that legitimize the student knowledge when obtained through distance education need to be implemented.

Faculty and student attitudes and limitations -- Lack of university faculty understanding of distance education technology and potential, coupled with the inertia of the current educational techniques are a major barrier for these technologies to develop. Changing tools and techniques that are currently used for teaching requires a substantial institutional effort.

DISTANCE EDUCATION TASK FORCE CHARGES

The IFAS Distance Education Task Force was formed in mid-1995 by Dr. Larry J. Connor, Dean of Academic Programs, and Dr. Christine T. Stephens, Dean of Extension, to develop a comprehensive plan for the Institute of Food and Agricultural Sciences' use of distance education into the next century. IFAS already has made use of distance education by delivering several courses via satellite or videotape. (See Appendix B.) This plan should include all aspects of distance education, including current and future infrastructure, personnel, faculty training, adult learners, dissemination of education to a growing Florida population when funds are shrinking for

classroom building construction, and educational activity selection and production. In order to develop this plan, the Task Force examined the following issues as set forth by Deans Connor and Stephens:

a. Specific teaching and extension subject matter opportunities which may be conducted effectively through distance education methods and technologies;

b. The types of programs to be conducted (workshops, in-service training, short courses, regular courses, conferences and credit/non-credit offerings);

c. The means whereby IFAS distance education efforts relate to the programs of other UF units, state universities, or state agencies;

d. Existing resources that could be used to further distance education programming;

e. The training, faculty support, and costs incurred in supporting distance education; and

f. IFAS Internal Management Memorandum 6CI-6.1104, UF/IFAS Policy on Distance Education for possible review.

SURVEY RESULTS OF IFAS TEACHING, EXTENSION, RESEARCH, and ADMINISTRATIVE ACTIVITIES

Two of the charges for the IFAS Distance Education Task Force to identify were (a) specific *teaching* and *extension* subject matter opportunities which may be conducted effectively through distance education methods and technologies and (b) the types of programs to be conducted (workshops, in-service training, short courses, regular courses, conferences and credit/non-credit offerings).

To accomplish this, a one-page questionnaire was sent in October 1995 to department chairs and Research & Education Center directors, requesting information on the types of programs, courses, or other activities IFAS could deliver via distance education technologies from July 1, 1996, to July 1, 1998, in four vital areas: *extension, teaching, research*, and *administration*. (See questionnaire, Appendix C.) Although it was not the responsibility of the IFAS Distance Education Task Force to examine *research* and *administration* functions, they were included to provide an overall scope and breadth for the variety of distance education programs, courses, and activities IFAS faculty said they could develop within two years. Fifty-nine survey forms were returned. The questionnaire examined such areas as educational and support needs for faculty, technology that faculty envisioned being used to deliver education, a course's projected delivery date, and the course or program's target audience.

Function, audience, and program offerings

Survey participants were asked how they would use distance education as per the four defined functions of *administration, extension, research*, and *teaching* in courses, programs and/or activities. Teaching full-credit courses received 30 responses; extension (including workshops), 24; research, three; and administration, two. (See Appendix D, Table 1.) Respondents said the courses, programs, and activities could be used in a number of ways to meet

the audience members' educational needs, such as providing full-credit courses, continuing education credits (CEUs), and in-service training for IFAS county faculty. (See Appendix D, Table 2.) Participants said 10 programs, activities, and courses currently are ready for delivery, with another 12 possibly ready during Academic Year 1996-97. (See Appendix D, Table 3.) Of the four responses regarding the frequency of in-service training, workshops and extension programs, three programs could be delivered once a year, one could be delivered twice a year, four could be taught quarterly, and one could be taught as many as six times a year.

The audiences listed by respondents were greatly diverse, ranging from undergraduate and graduate students, county extension faculty, Florida teachers and food, agricultural and natural resources industry workers. (See Appendix D, Table 4.) Although undergraduate students and county extension faculty made up a sizable portion of the identified audiences, the overwhelming majority of programs could be targeted for such audiences as public school teachers and employees in the food, agricultural and natural resources industries. Many respondents listed more than one audience per program, activity, or course. For example, an undergraduate horticulture course also may have an audience of lawn-care specialists and the general public.

Faculty educational and support needs

Respondents identified areas in which they thought they would need assistance to deliver their program via distance education technologies. (See Appendix D, Table 5.) The area of greatest concern for faculty was finances; most faculty planning distance education courses want assistance with funding for producing visual aids, developing instructional materials, and disseminating materials. Faculty also identified "training to use distance learning technologies," release time, and "assistance with instructional design" as major areas they needed help with in the design and development of their courses.

Technological tools or media

For the delivery of distance education courses, programs, or activities, satellite uplink/downlinks and Internet/World Wide Web were the most popular media listed, with videotapes, two-way audio/video and CD-ROM following closely. (See Appendix D, Table 6.) A two-way audio/video system was listed by many people as their *"ideal"* choice of delivering information and education.

The technological tool or medium was examined as to how it corresponded with the four defined functions of *research, extension, teaching*, and *administration*. *Research* and *administration* functions showed that computer applications, such as electronic mail and Internet/World Wide Web, were the primary choice for providing and delivering information. The *teaching* and *extension* functions were more varied as to the types of media that were listed. Video-based media -- videotapes and satellite uplink/downlinks -- were the primary choice for *teaching* applications. (See Appendix D, Table 7.) Those who listed *extension* applications, on the other hand, were equally apt to use computer-based media as video-based media to deliver information. (See Appendix D, Table 8.)

DISTANCE EDUCATION TASK FORCE RECOMMENDATIONS

The Task Force recommends that IFAS focus on the following areas for future distance education needs:

- Forming a Distance Education Committee
- Prioritizing course and program offerings
- Developing a support structure
- Designing methods for faculty incentives to develop distance education programming
- Developing distance learning materials
- Maintaining and developing physical (technological) and personnel infrastructure
- Developing a training program
- Establishing a marketing plan and
- Developing distance education linkages with other colleges at the University of Florida, state and federal agencies, and businesses.

Distance Education Committee

This section discusses the formation of a Distance Education Committee and the committee's responsibilities.

- An *Off-Campus Instructional Programs Committee* already exists, whose charge it is to recommend off-campus course offerings. It is recommended that this committee oversee the use and delivery of distance education courses and educational programs within IFAS, as well as off-campus instruction. It is further recommended that the committee be renamed the ***Distance Education Committee*** and be jointly appointed by the two deans.
- Committee members should represent a variety of disciplines within IFAS. It is recommended that the committee be composed of representatives from the following areas or departments: a faculty member from Agricultural Education and Communication, an extension faculty member, a faculty member with strong teaching orientation, a representative from Educational Media and Services, a chairperson, a Center Director, one assistant or associate dean, and a county extension faculty member.
- The Distance Education Committee will recommend to the Deans the courses and extension programs to be delivered via distance education from submissions received at least one year in advance from academic units, Research and Education Centers, and Extension Offices. This committee will be responsible for soliciting IFAS courses and programs to be delivered via distance learning technologies, categorizing and prioritizing programs, and presenting recommendations to the Deans. The purpose of forming this committee is not to add a layer of bureaucracy to the selection process but to provide a central location for interested faculty to make funding and informational requests about distance education programming.
- Recommendations for approving distance education programs would be made on such criteria as cost benefit per student, availability of other courses in the state and the country, technical subject matter, and faculty's time per student ratio. The Deans would then take the committee's recommendations, and the Deans would make the final decision on program offerings via distance education.

Prioritize course and program offerings

This area encompasses both for-credit courses and extension education activities, such as workshops, seminars, meetings, and short courses, chosen for distance education distribution and the mechanisms needed to make these course and program selections. Distance education, therefore, should provide an array of activities ranging from for-credit courses to non-credit short courses to seminars provided for extension audiences. An evolution as to the number and types of programs IFAS offers will occur and become more progressive and comprehensive over time.

Currently, no formal process has been established for selecting academic courses and extension education activities to be distributed via distance education. The Task Force recommends the following actions be taken to prioritize course and program offerings:

- The Distance Education Committee, in cooperation with Educational Media and Services, should conduct a *needs analysis*, which would determine the "high-priority" or "high-demand" courses and extension programs to deliver around the state via distance education technologies. The needs analysis should examine what courses and programs already exist -- similar to ones that could be provided by IFAS faculty -- and determine which ones should or should not be duplicated (market oversaturation). The needs analysis also should address issues relating to the best way the programs should be marketed.
- As part of the needs analysis, IFAS departments and the School of Forestry Resources and Conservation, Research and Education Centers, and County Extension Offices should conduct individual studies to determine what should be done in the area of distance education from their units as it relates to the overall IFAS outreach mission. These groups should establish individual plans of how to use distance education to support their academic, extension, and outreach activities.
- Priority for distance education programs should be given to the following areas: supporting satellite campus programs in Ft. Lauderdale, Milton, Immokalee and other locations; providing general courses and extension programs to interested clientele; provide extension programs that support state major programs and other programs of statewide and regional significance; and specifically designing courses to serve unique needs of Floridians. For example, a for-credit or short course could be developed related to the horticultural interests of home owners.
- Preference for selection should be given to these "high-priority" or "high-demand" courses or extension activities that traditionally have been needed by many students or extension audiences or have the potential for high demand. "High-demand" courses most likely would be developed for distribution via video formats (videotape, satellite, compressed video) which are more costly than distribution via the Internet and World Wide Web.
- Distance education courses that would have low enrollments but would have regional, national or international impact in scope, also should be considered as "high priority." To date, courses have been targeted primarily to Florida residents. A highly specialized and specific course that an IFAS faculty member teaches that is not offered at other higher education institutions should be considered "high priority." These specialized courses could be

offered via the World Wide Web, for example. As distance education broadens the reach of institutions, consideration must be given to courses that could be distributed to national audiences via the University's membership in the A*DEC Consortium or to international audiences, such as Caribbean and Latin American countries.

- Faculty pursuing grants that would fund distance education programs should communicate with the Distance Education Committee before submitting the grant proposal so it will be placed in a "high-priority" position if the grant is awarded.
- In addition to for-credit courses, extension activities should be emphasized, and these activities should go beyond the training of extension personnel. Distance learning should be viewed as an important vehicle to deliver extension educational programs of regional, state, or national importance. Partnerships with private and public organizations should be encouraged in the delivery of distance education programming. School teachers could receive in-service training; pesticide applicators could get continuing education credit on such topics as integrated pest management; and food handlers could receive training on proper food preparation practices. Distance learning should be used to support extension design team programming and statewide major programs.
- The initial goal in course and program selection should be to designate for distance education delivery six to twelve half-day to full-day extension activities and two to four high-demand, semester-long courses a year using satellite or compressed video technology. In addition, using Channel 10-UF, courses such as *FOS2001: Man's Food* and *WIE2040: Wildlife Issues in a Changing World* should be identified and distributed in Gainesville and possibly on other cable outlets around the state. Courses and extension programs should be identified and developed for delivery via the Internet. Selected academic courses, with either high demand or those that serve a unique and important audience, should be developed and distributed via video tape in lieu of offering such courses via correspondence.
- A task force should be developed to study the feasibility and potential of an interdisciplinary professional terminal master's degree within IFAS, including the components of such a degree. It is further recommended that distance education be used as one of the primary modes of delivery for the professional master's degree.
- At a future date, two studies should be conducted to assist the course and program prioritization effort. First, it is recommended that the Teaching Resource Center (TRC) be responsible for documenting the IFAS-produced distance education courses and materials that already exist. Second, a study on the cost-benefit analysis of distance education and the attitudes of learners and what they learn in relationship to learners on campus, should be conducted in a longer-term context -- within two to three years. The study should be conducted as a TRC/Program Evaluation and Organizational Development combined effort.

Support structure

This area focuses on assisting the learner, through physical means, to make the distance education process as seamless as possible.

- A service charge, similar to a laboratory fee, should be assessed to students for classes and/or extension activities taught via distance education. This service charge would be used to support the distance education effort by offsetting such costs as mailing books to sites or individual students, mailing handouts and other printed materials, and paying for additional graduate assistants and staff time for the course or extension activity. It is not expected that distance education will be a money-generating venture; rather, distance education simply will be another approach to reach a broad base of students in a **cost-effective** manner.
- IFAS should discontinue delivering courses via correspondence. This need should be met with distance learning where IFAS would accrue the FTEs generated by enrollment. A system should be developed to register students so that all FTE generated would accrue to IFAS. It is also recommended that the Division of Continuing Education (DOCE) be contacted and that distance education course offerings by IFAS be placed in DOCE's continuing education Correspondence Catalog and other appropriate publications.
- A student's ease of accessibility should be the criterion for attaining books, printed journals, and learning materials. Three possibilities are suggested for students to receive materials at a distance. First, the instructor could order texts from textbook publishers and mail them to the individual students, or have the students order the texts directly from the publisher. Printed materials would be mailed to students after registration. Second, formal arrangements could be made with college/university bookstores in advance to have materials/textbooks available on bookstore shelves for students who will take a course at a distance. Arrangements could be made to mail the entire set of materials to the students. Third, the Division of Continuing Education's "Bookstore" may be utilized where DOCE would mail materials via UPS to distance students. However, DOCE's Department of Independent Study specializes in correspondence study, not distance education, so arrangements between IFAS and DOCE may need to be established for the purpose of distributing distance education materials. Fourth, IFAS Educational Media and Services could assemble the educational material needed to support the course or extension activity, receive payment from the student or client through a designated incidental account, and send the material directly to the individual.
- Alert college/university librarians near participating distance education sites to students' needs in checking out books or other materials. The development of a "virtual library" via the Internet also should be a priority for the University of Florida.
- Because students will be at various sites, it will be necessary for faculty to have "virtual office hours" so students can call in with questions or log onto a bulletin board or a "chat" group. As a result, it is recommended that additional resources be allocated to cover telephone charges and other infrastructure requirements during the semesters when a faculty member in that department has a distance education course. Also, electronic mail should be made available to faculty who teach distance education programs and students who take distance education classes so that they can interact by computer.

- A site facilitator should be identified for each course or program offered via distance education to Research and Education Centers or county extension offices. The facilitator should be knowledgeable about the subject matter content, if at all possible. The facilitator will be trained in distance education methodology by Agricultural Education and Communication faculty and in equipment use by Educational Media and Services staff.

Faculty incentives

This area addresses concerns faculty may have about the time and commitment involved in developing a distance education course.

- Faculty should receive appropriate release time the semester prior to a distance education-delivered course and/or extension program in order to adequately prepare for the distance learning activity.
- During the semester when the course, activity or program is being presented, the faculty load should be adjusted so that adequate time is allotted to the distance education course and/or program.
- Proper weight should be given to courses and extension activities delivered via distance education when faculty are evaluated for promotion and tenure purposes.
- A producer from Educational Media and Services should be assigned to the faculty member who will be delivering the program. The producer will assist the faculty member in all aspects of video or graphics production for a video-based course or in computer applications for an Internet-based course.
- *IFAS Internal Management Memorandum 6CI-6.1104, UF/IFAS Policy on Distance Education* should be revised to include procedures for using other available technologies in addition to satellite delivery. These procedures would include course/program offerings, fee structures, and other policy areas included in this report. A subcommittee of the Distance Education Task Force already has been formed to revise the IMM. The subcommittee's recommendations will be prepared in a document separate from the Task Force's report and submitted to the Deans for Academic Programs and Extension for review and approval.

Distance education materials

To simplify the process of adapting of IFAS distance education materials to a variety of IFAS departments and programs, and to ensure the effectiveness of these materials to other state or federal units, it is recommended that the Distance Education Committee, in cooperation with departments and units, establish criteria for all distance education materials that will be recognized as part of the distance learning effort of IFAS. Other recommendations that would result in distance learning materials that could be used by a broad group of units include the following:

- Because of recent improvements in communication technology, large amounts of information can now be delivered through a growing number of media. However, Distance Education Task Force members believe strongly that ***information*** is distinctly different from

educational material. Scientific or technical information developed by experts has many practical applications (fact sheets, circulars), but distance learning programs must be based on a curriculum that is founded on learning objectives and oriented to measurable improvements in competency-based skills. Therefore, distance education programs that are to be added to the current educational programs should be reviewed by individuals with training in curriculum development and learning measurement.

- Whenever possible, IFAS units should endeavor to develop overlapping distance education materials that could be used for a variety of purposes. To do this, the Teaching Resource Center should develop an educational series explaining the development of teaching materials or distance learning materials that can be used by a variety of IFAS groups.
- Non-IFAS agencies should be encouraged by IFAS to use IFAS distance education materials either in their programs or to train their professionals.
- Other agencies should be solicited to co-develop and help in the delivery of materials for university instruction or for training extension professionals. In particular, IFAS should closely examine materials developed by other members of the A*DEC Consortium for potential adaptation and use in Florida.
- All instructional materials needed to deliver a course or an extension program should be assembled and sold as a packet to students and clients. For-sale materials would be used to offset the actual cost of providing distance education activities. The cost of all materials should be included in the advertisement when the course or program is marketed. It is further recommended that these materials be mailed to the students/clients at the beginning of the course or extension program and that all of the students be required to buy this set of materials, including textbooks, written materials, video tapes, computer disks, and other instructional materials. It is also recommended that over time, instructional materials be placed on the Internet and World Wide Web so they can be easily accessed by students/clients at distant locations.
- The role of the Teaching Resource Center (TRC) should be broadened to include educating all IFAS faculty about distance learning through such materials as written and audio/visual resources which would be housed in the TRC. More resource and training material, such as the booklet *Distance Education Considerations for IFAS Faculty* (Telg, 1996), also should be developed.
- Continue plans to place the Florida Agricultural Information Retrieval System (FAIRS) database and the remaining IFAS publication inventory on the World Wide Web for easy and cost-effective access by clientele.

Technology

IFAS faculty should use and be encouraged to use a variety of media in their distance education delivery. No **one** medium will be "best" for every program or circumstance. This section examines possible technological partnerships and technologies IFAS should investigate for present and future uses.

While technology and the availability of different combinations of technology are many and varied, it is recommended that IFAS concentrate on three basic forms of technology for developing distance education systems. These forms were outlined by former Provost Andrew Sorensen in a Jan. 9, 1996, memo to the Distance Education Task Force, deans, directors and department chairs. These technology forms are as follows:

- *Satellite transmission to disparate downlink sites.* Programs using satellite-based technology will involve one-way video and two-way audio. Maximum use of satellite transmission will require the addition of a fixed uplink facility on the campus. The present mobile uplink is often not available and is becoming technologically outdated. Downlink facilities are already available throughout the state to receive the programs transmitted via satellite-based delivery systems. All of Florida's 28 community colleges, many high schools and five of the nine public universities have downlinks, as do UF/IFAS facilities throughout the state. (See Appendix E for a map of UF/IFAS facilities with satellite downlink dishes.)

  While in recent months the costs of satellite transponder time have sky-rocketed, projections for the future indicate lower hourly costs for transponder time due to almost oversupply of new transponders that have come on-line since December 1995.

  Additionally, the state of Florida has entered into a long-term agreement to lease a complete transponder on one of the new communication satellites. Prices quoted by state sources show that the costs are two-thirds lower than those experienced during 1995-96. Furthermore, digital compression technologies are becoming more widespread in the industry. IFAS is in a position to upgrade most -- if not all -- of its satellite receivers through a special grant to be provided by the A*DEC Consortium. Digital compression permits up to seven signals per transponder as opposed to one with analog transmission. Delivery costs could be substantially reduced.

- *CODEC units to transmit on land-lines to established classroom facilities in various locations in the state.* CODEC (coder/decoder) equipment will provide two-way video and two-way audio. If UF is to use this system effectively, an originating studio-unit must be available on the campus (or at some central site), and receiving CODEC units must be available at other points throughout the state. The receiving units will have to be purchased by UF. Because this system uses existing land lines, networks can be built and expanded incrementally. Each of these units will cost $30,000 to $50,000, but would be available for uses other than the initial intended use. In the short run, cost will limit the CODEC technology to point-to-point instead of point-to-multipoint. Thus, the CODEC system would not be the technology of choice for leveraging resources with large audiences; however, it would be useful in delivering academic courses to Ft. Lauderdale, Immokalee, Milton to support undergraduate instruction.

- *Internet and World Wide Web capabilities with networked or modem-accessed personal computers.* The Internet and World Wide Web are growing exponentially. By November 1995, there were more than 18 million Web users on the Internet (Pitkow & Kehoe, 1995). Programs delivered via personal computers will be possible as the technology evolves, newer equipment becomes available, and Internet access becomes more widespread. The technology will be effective in reaching individual learners and small groups.

  The most relevant characteristics of this technology to distance education efforts include the ability to transmit a wide array of digital data on demand, low costs, accessibility, and ease of use. Accessing materials through the Internet is simple, relatively fast and convenient, and it is continuing to evolve very rapidly. Thus, although in its current state is usable for distance education, its capabilities will improve greatly in the immediate future. Many education researchers have noted that the Internet is the first new infrastructure to develop in nearly a century. Most likely, this will result in increases of speed and capabilities (significant to real-time interaction using video and sound) that will greatly improve the availability of tools for reaching remote and widely dispersed students.

  The Internet provides a direct connection between the educator and the student that is less expensive and more accessible than any other means of distance education. As opposed to satellite- or CODEC-based information delivery infrastructures which require expensive proprietary equipment, networks, and connections, Internet-based distance education strategies build upon an existing infrastructure. Potential students and clientele may soon have network connections in their homes that would be capable of live, two-way audio/video interactivity. Also, the Internet allows the real-time interaction between student and instructor that is essential in the advanced stages of the learning process. Course materials can be obtained on-demand using the Internet. Interactive sessions need not be scheduled regularly in a manner similar to a conventional classroom session. Asynchronous learning systems also may be used when students can access and complete lesson modules and take examinations at their convenience at varying times.

  To take advantage of this technology, it is recommended that all county extension offices and Research and Education Centers have access to the Internet.

Regarding technology, it is further recommended that IFAS:

- Continue its investment in CD-ROM technology, which is an interactive multimedia technology allowing interaction between users and large amounts of text, graphics, video and audio. The amount of interactive material available is growing rapidly, and IFAS has a good track record in use of CD-ROM as an information delivery medium. Cost of development is justifiable in applications where the user base is likely to be large.
- Deliver courses and/or extension programs via videotape. The hallmarks of the videotape delivery system are flexibility, low cost and storage. Credit and non-credit programs are captured on videotape and distributed by various means to off-campus locations for playback as required. Videotape equipment is widely available at reasonable cost and it is in use in most public and private institutions, including UF. Human resource managers and individual students may schedule classes to coordinate with ongoing work schedules -- an important benefit. Videotaped programs may be stored for long periods of time for later playback. An

instructor can reach many more students through videotape delivery than on campus, thereby increasing faculty-student ratios. High-demand courses, such as *HUN2201: Fundamentals of Human Nutrition, FOS2001: Man's Food,* and *WIE2040: Wildlife Issues in a Changing World,* should be developed for videotape delivery, so they could be stored on tape and then distributed to students or used with other delivery modes, such as the Internet.

- Consider outsourcing. While the capital expenditures required for building infrastructure are significant, in some cases those infrastructure needs can best be met through outsourcing. UF/IFAS should carefully examine all available alternatives and take advantage of outsourcing infrastructure and operational needs where appropriate.
- Educational Media and Services should investigate using the local public access television Channel 10-UF or Cox Cable's Channel 8 to deliver distance learning credit courses, short courses and conferences. Cox Cable and other cable outlets across the state also have channels set aside for educational programs. Costs are relatively low for cable-distributed courses. For example, Channel 10-UF costs $12 an hour; however, the College of Business Administration has purchased most of the broadcast day's time. Still, cable should be investigated to deliver programming.
- IFAS should use existing video production facilities on campus or construct its own mediated classroom and studio to deliver videotape, compressed video and satellite programs and Internet/World Wide Web classes. Examples of such video production facilities are in the Colleges of Engineering, Journalism and Mass Communications, and Health and Human Performance. The College of Education is in the process of developing a mediated classroom as part of its distance education experimental laboratory. Existing facilities already have the video equipment in place necessary for a broadcast production. Setting up broadcasts from remote sites that do not have video production equipment in place presents some difficulties to video engineers. In the past, IFAS has used the College of Engineering's mediated classrooms for satellite courses. This practice should continue.
- IFAS personnel should actively use the new Distance Educational Instructional Support Hub (DISH), currently under development jointly by the Faculty Support Center and the College of Education. It will open in Spring 1997. The training laboratory will provide faculty members in all colleges a place to experiment with instructional strategies and technologies in a supported, on-campus setting. DISH will include a video production studio, a multimedia classroom, and a CIRCA computer laboratory, all in Norman Hall. DISH will connect to the UF cable television network and to a lecture room in Turlington Hall. Professors can experiment with teaching a class in Turlington and have a remote site in Norman with full two-way audio and video capabilities.
- Faculty should be encouraged, through educational methodology workshops and seminars, to use a variety of media in the delivery of distance education programs. For example, PowerPoint or Harvard Graphics programs could be mailed on disks or transferred over the World Wide Web for use in audioconference question-and-answer programs by IFAS faculty or extension agents.

The Distance Education Committee or a DEC-appointed subcommittee, in conjunction with Educational Media and Services and Facilities and Planning and Operation should undertake the following measures to increase opportunities for faculty to use distance education technologies in

IFAS buildings at the Gainesville campus, Research and Education Centers, and County Extension Offices:

- Develop a comprehensive plan to prioritize the wiring of more classrooms for interactive computer/video or to access the Internet and World Wide Web, such as the multimedia classrooms in McCarty Hall.
- Develop a comprehensive plan to prioritize the wiring of classrooms with telephone jacks to allow for audioconferencing with students at other locations or for guest speakers at locations across the state or country.
- Connect off-campus IFAS locations to the Internet via a high-speed link. Remote facilities currently using a LAN system should be connected via synchronous frame-relay, ISDN, or leased-lines at a minimum of 128kbs. Facilities without LAN connections should have access to a 28.8 PPP dial-up facility via a local or toll-free call.
- Develop distance education equipment compatibility standards across campus and the state that would ease upgrading and maintenance of all equipment (satellite dishes, computers).

It is also recommended that Educational Media and Services, in consultation with the Dean of Extension and Dean of Academic Programs, work with Facilities Planning and Operations to make certain that all remodeling or new construction plans consider the implications of distance education and educational technologies.

Personnel responsibilities

Instructional support services must be in place to support transitioning faculty to a mode of operation consistent with current and developing technological delivery systems. To accomplish this, it is recommended that a concerted plan be developed in which faculty and staff who are responsible for various aspects of training distance education instructors know what each person's responsibilities are. However, for the most part, trainings will be conducted in a team-based, coordinated effort. The delineation of responsibilities is to inform interested faculty and staff whom to contact initially with distance education-related questions. It is recommended that the following units be responsible for the following functions:

Agricultural Education and Communication Department

- Assist with the design of curriculum and instructional methods, materials, and evaluation for distance education.
- Consult with faculty members, who are in the early planning stages of developing a distance education course, on instructional design of distance education courses.
- Train faculty and site facilitators on presentational styles and delivery of instruction using technology.

Educational Media and Services

- Train faculty and site facilitators on the various technical equipment that will be necessary for course delivery. For example, it would be necessary to train site facilitators in the use of the satellite downlink equipment to receive satellite-delivered programs.

- Coordinate all marketing activities, including advertising and market research.
- Conduct all production-related activities (videotaping, satellite delivery, compressed video, Internet/World Wide Web layout and design support, graphic design and artwork).
- Produce instructional support materials, such as videotapes and printed materials.

IFAS Information Technology Office

- Provide training on Internet and World Wide Web applications.

IFAS Computer Network

- Maintain World Wide Web and Internet support.

County Extension Offices and Research and Education Centers

- Identify persons at each county office and Research and Education Center to fill the following roles:
- Site coordinators -- Coordinates and oversees distance education offerings at their sites.
- Equipment technicians -- Operates equipment at their sites.
- Site facilitators -- Serves as local content or subject matter specialist at their sites.

Faculty and staff training

To promote the spread of distance learning capabilities in IFAS, it is recommended that training be conducted for IFAS instructors, graduate assistants, extension faculty, site facilitators, and select staff personnel. As mentioned in the previous section, Agricultural Education and Communication is responsible for training in distance education methodology, Educational Media and Services is responsible for training on equipment operation and IFAS Information Technology Office is in charge of Internet and World Wide Web training. Specific recommendations are as follows:

- A distance learning center where IFAS faculty could view and examine examples of distance learning programs and materials so that faculty could be familiar with successful and unsuccessful methods being employed, should be developed. We recommend that this center be housed within IFAS's Teaching Resource Center.

- Training in distance education instructional design, delivery and technology should be a requirement for any faculty member, staff member or administrator planning to teach a course, program or activity or to deliver a presentation via a distance education technology. In addition, chairpersons and Center Directors should participate in in-service training on distance education methods.

- The Teaching Resource Center should sponsor and conduct distance learning workshops as part of the annual extension training calendar. The workshops could draw on faculty currently conducting distance learning programs, while at the same time bringing in teaching methods specialists, technology professionals (computers, communication systems, etc.), and curriculum development experts.

- The Teaching Resource Center should sponsor and conduct regularly scheduled distance learning seminars to acquaint on-campus faculty and instructors with hardware, software and recent trends in teaching methods for effective distance-learning programs.
- The trainings on equipment operation and distance education methodology should be conducted in a joint workshop sponsored by Agricultural Education and Communication and Educational Media and Services.
- Over time, Agricultural Education and Communication should develop distance education modules that include videotapes and publications explaining curriculum development and the development of such competencies as oral presentations and teaching large and small classes.
- An Internet-based Web page, newsgroup and/or listserve on the topic of distance learning should be established. The Web page, newsgroup and/or listserve would allow faculty members to share information about teaching methods and proposed classes.

Marketing

All marketing efforts will be assigned to Educational Media and Services. EMS will be responsible for the overall coordination, planning, and implementation of the distance education marketing effort. This section details some marketing-related recommendations.

- A marketing system should be developed to advertise the courses and programs offered via distance education in IFAS. It should be designed to be a consistent and systematic effort to assure adequate publicity of the distance education offerings. It is suggested that the Gator/National Agri-Marketing Association and/or Agricultural Communicators of Tomorrow student clubs be recruited to assist EMS in the development of a marketing and communication strategy to advertise these distance education courses in Florida and throughout the country.
- Some courses previously taught via satellite and stored on videotape should be made available to students for for-credit classes. They should be advertised as widely as possible, in such publications as the UF/IFAS Resource Catalog, extension newsletters, and the Division of Continuing Education's Catalog, and in such places as the UF/IFAS World Wide Web site (http://www.ifas.ufl.edu/~mediaweb/edmedia.html).
- All marketing efforts should make certain that Research and Education Centers and county extension offices are recommended locations for delivery of distance education programs.
- The marketing plan should detail how particular audiences for particular subject matter can be targeted. Also, the plan should examine how academic departments should be involved in planning for outreach.

In addition to **outreach** marketing, a marketing plan should be developed for ***inreach***. Like any new technology, distance education techniques will have to be adopted by IFAS faculty to supplement current teaching programs. For distance education to successfully complete this transition, it will have to be specifically marketed to the faculty who will adopt it. The importance

of this new approach must be presented as being a method to successfully carry out the current teaching mission.

Linkages with other entities

Linkages with other colleges, state and federal agencies, businesses should be established for the purpose of sharing distance education materials and the dissemination of education over a distance. It is recommended that IFAS should:

- Continue its membership in the A*DEC Consortium. The IFAS distance education system should closely examine future initiatives to be launched by A*DEC, which will result in greater collaboration among the A*DEC members for formal and informal distance education programs.
- Partner with such groups as the Panhandle Area Educational Cooperative -- which already has technological infrastructure in place in Northwest Florida -- and other similar organizations to deliver for-credit, extension education programming, and recertification courses.
- Participate with University of Florida colleges who are part of the campus-based Distance Learning Council to investigate local, state, national and international trends and to recommend actions appropriate for the University.
- Encourage the State Legislature to appropriate sufficient funding to support a comprehensive but distributed distance learning program system such as the Indiana Higher Education Telecommunications System (IHETS).
- Explore possible audiences and partnerships with organizations across the state and country that would benefit from the expertise of IFAS faculty members.
- Become an institutional member of the Florida chapter of the American Distance Learning Association. This statewide organization, which currently is being formed, will allow IFAS to stay abreast of current legislative mandates, professional linkages, statewide infrastructure, and educational opportunities in Florida relating to distance education.
- Explore programs of potential partnerships with the Sloan Center for Asynchronous Learning Environment (SCALE) at the University of Illinois, Champagne-Urbana.

In carefully selected instances, distance education equipment purchased by IFAS could be loaned to non-IFAS units participating in related educational situations. Relationships should also be solicited for IFAS to use equipment that has been acquired by related institutions and programs. In this manner, IFAS and other units can reduce costs and guarantee the interface of educational materials and programs.

It is also recommended that the IFAS "Info-Structure Task Force" be aware of the Distance Education Task Force's recommendations as it deals with *info-structure* in IFAS.

CLOSING STATEMENT

Distance education will cause a "blurring of the lines" between IFAS's Extension and Academic Programs. Stated simply, Extension's mission has been to take "the university to the people," to deliver educational programming to the public. In the past, that charge has not regularly including providing for-credit academic courses. However, one of the mechanisms to deliver information to the public by distance education technologies at county extension offices will be through academic courses, as well as extension short courses, seminars or workshops. In addition, new methods will have to be developed to teach traditionally disseminated academic courses and extension activities when delivered via distance education. Therefore, these new and existing distance education technologies will challenge the "traditional" ways both Extension and Academic Programs have delivered information and education to the public.

APPENDIX A
Available Distance Education Technologies

Distance education describes educational activities which links two or more people at two or more locations separated from one another by space and/or time. While early forms of distance education were generally non-interactive, recent technological developments have favored the use of distance education systems that promote teacher/student interactivity.

Generally, technology can be classified into non-interactive and time-delayed interactive systems, and interactive distance learning systems. Non-interactive and time-delayed interactive systems include printed materials, correspondence, and one-way radio and television broadcasting. When placed on the McGrath and Daft "Richness Hierarchy Scale" (Figure 1, pg. 3), non-interactive and time-delayed interactive systems are the leanest form of information technology and could generally be considered less suitable for use in distance education, particularly in light of their abilities for interactivity between teacher and learner.

Interactive distance learning systems can be classified as "live interactive" or "stored interactive" and range from satellite and compressed videoconferencing to computer-assisted instruction. Given the need for interactivity between teacher and learner, our technology assessment and recommendations will, with one exception, be limited to those interactive technologies which link two or more people in locations that are separated by time and/or place.

Several different types of telecommunications technology support the delivery of educational programs to single and multiple sites throughout Florida, the Southeast and even the nation. Following is a list of some of these technologies. It must be noted that these delivery methods can be used individually or in tandem with other technologies.

Satellite

The primary advantage of a satellite system is the delivery of a high-grade signal, simultaneously to multiple locations over a wide geographic area. Satellite delivery is interactive; although expensive, it can accommodate two-way audio and video. Faculty and students can carry on conversations, but in most cases only the instructor appears on television. The signal (analog or digital) is delivered in real time with full-motion and the quality of the video and audio signal is excellent. Teaching costs are leveraged. Satellite delivery allows a single instructor to reach many students at one time; class size is not mandated by number of seats in a single room; students can watch in their home if they have a satellite dish.

The disadvantages of satellite delivery include the high costs of transmission and transponder and reception equipment, but these are beginning to decline. Satellite signals are also subject to atmospheric, building structure, and electronic interference. Video signals are somewhat degraded by compression. In general, schedules are inflexible once established, and students must adhere to them if they are to take advantage of the two-way audio capability.

Microwave

The benefits of microwave delivery are similar to those of satellite. Microwave delivery is in real time, usually with one-way video and two-way audio to single or multiple sites. Programs are interactive via two-way telephone connections between the instructor and the students. Signal dispersion is typically restricted to a 25 mile radius of the transmitter; a wider geographic area can be served through the use of repeater antenna/receiver systems. The quality of the video and audio signals is excellent. Instructor-student ratios can be increased and the number of students taught is not limited by the size of the classroom.

Microwave systems require a substantial investment in the transmission system although maintenance costs are reasonable, and receiver expenses are modest with smaller antennas. Signals can be blocked by physical structures, atmospheric conditions and some other forms of electronic signals. Students must adhere to scheduled broadcast times if they are to take advantage of the two-way talk back feature.

Videoconference

Videoconference delivery is characterized by real time, interactive transmissions. Videoconference signals are typically delivered in a highly compressed manner via telephone lines or uncompressed over high-bandwidth networks. he quality of the video signal varies widely and is in proportion to the signal compression; highly compressed video signals are of lesser quality but usually acceptable for administrative and educational purposes. The delivery medium is fully interactive with two-way audio and video. Both instructor and students can easily communicate, visually and orally in a realistic manner. The medium promotes and supports interactive teaching methods.

Videoconferencing requires a substantial investment at each and every participating location. Occasional telephone line interference degrades the video and audio signals. Delivery costs are significant, and only slightly lower than satellite delivery costs. Delivery costs are indirectly proportional to level and frequency of use. Thus, unless videoconferencing equipment is used almost daily, its annual operational costs per use can be substantial. Because programs are broadcast in real time, scheduling is inflexible once established.

Compact Disk

Essentially, compact disks (CD) offer interactive (preferred) or non-interactive delivery through computer systems. The advantages of CD are compactness, large storage capacity (video, data or audio), portability, flexibility and ease of retrieving. Computers are in widespread use throughout homes and businesses and the cost of upgrading to a CD system is low to moderate. The small size of the CD allows for great portability. Data, voice and video can be retrieved instantly at any time the CD is in operation; users can access or browse forward or backward at will. Interactive CD can lead students through lesson materials with a statement, question and answer format; a limited sample has shown this medium to be a powerful educational tool. Disadvantages include significant production costs, incompatibility of equipment, and the need for instructors to be well versed in the use of distance learning technologies.

Wired Networks

Wired networks are hardwired links using copper wire or fiber optic cable. These wired systems are highly resistant to noise interference. They can transmit a range of bandwidths suited to the needs of a variety of users and consistent with the availability of services from providers. Existing cables can often be used with new protocols to deliver a higher bandwidth which expands services to the use without having to lay new additional cables. As an educational delivery tool, wired networks can provide a full range of interactivity including audio, video, and data, or any combination of these components bi-directionally. Another advantage of wired systems is the ease of tracking they provide for cost accounting and security purposes. These systems also support interactive teaching in real-time.

Disadvantages of wired networks include their large installation cost and time required for installation. The operational costs of outsourced wire networks are extremely expensive because of the line quality required. The delivery of expanded services such as data, voice, and video requires compression and switching capabilities that have not yet been widely adopted. Differences in protocols use by various providers also impede the use of full services for educational delivery. Also, learners must travel to specific sites where such networks are installed.

On-line Networks

Educators with access to a computer and a modem have access to an increasingly large selection of on-line data resources and Internet service providers. These services typically offer electronic mail, research databases, and forum and discussion groups for a variety of special interests. On-line services typically charge some combination of a monthly fee -- typically around $15 a month -- a per-minute connection fee, and connection surcharges for access to specific information sources.

Data networks are growing globally. It is anticipated that there will be an Internet connection for every human on Earth by the year 2001. Networks which transport information in every conceivable form promise to revolutionize work processes and global economies, and eventually will transform how we view education. Instant access to information enables "just-in-time" training. Economic forces, combined with wide information access, will result in a better integration of education with other life experiences.

APPENDIX B
IFAS Programs Delivered Via Satellite and/or Videotape

December 14, 1989	Solid Waste Composting Technologies
August 9, 1990	Long-Range Planning
March 19, 1991	Improving FFA Proficiency Awards
June 23, 1992	Using Small Animals in Teaching/Biological Principles in Agricultural Education
Jan. 5-June 10, 1993	Plant Pest Management
March 30-April 22, 1993	Veterinary Medicine/Aquatic Pathology
June 10, 1993	Mosquito Control
June 17, 1993	Disaster Preparedness
October 14, 1994	World Food Day Teleconference
Spring 1994	Wildlife Issues
Spring 1994	Environmental Education
Spring 1995	Interior Plantscaping
Spring 1995	Human Resource Management in Agribusiness
April 13, 1995	IPM Training -- Jamaica
Fall 1995	General Horticulture
Spring 1996	Introductory Food Science
August 20, 1996	Disaster Preparedness Training
Fall 1996	Food and the Environment
Fall 1996	Computer Technologies in Agriculture and Natural Resources Management

APPENDIX C
Distance Education Questionnaire Distributed to IFAS Department Chairs and Research and Education Center Directors

IFAS COURSES/PROGRAMS DELIVERABLE VIA DISTANCE LEARNING TECHNOLOGIES, 1996-1998

Provost Sorensen has asked that each college provide a list of courses, programs, and activities that can be delivered via distance learning technologies in the near future (July 1, 1996 to July 1, 1998). Please take time to complete this form by filling in the blanks with the information requested. Please divide your list into **"Research," "Teaching," "Administrative,"** and **"Extension"** activities. Examples you might provide may include sharing research findings, for-credit courses, in-service or continuing education-credit seminars, administrative interviews, or extension sessions on varying topics.

Also, please identify faculty educational needs as they relate to distance learning (assistance with instructional design; amount of release time, if any; funding for visual aids; faculty training to use distance learning technologies), or technology needs as they relate to distance learning. Please be as thorough as possible. Please return this form to my office by **October 25, 1995**. *(Reproduce this form as necessary.)*
Thank you.
Jimmy G. Cheek

DEPARTMENT _____

Department Chair _____

Please check which category the following "Course/Program/Activity" description best matches:
___ Research ___ Teaching ___ Administrative ___ Extension

Course/Program/Activity _____

Person in Leadership Role _____

Semester and year the course/program/activity could be delivered _____

Educational Needs _____

_____

_____

_____

Technology Needs _____

_____

_____

_____

If this is a **for-credit course**, which semester or semesters during a given academic year do you envision this course being taught? (Check all that apply.)
___ spring ___ summer ___ fall ___ not applicable

If this is **program/activity** (a **not-for-credit** presentation), how many times during a given year do you envision it being presented? (In the space provided, please write in the number of times it could be taught in a year. Leave blank if *not applicable*.) _____
Please check which category the following "Course/Program/Activity" description best matches:
___ Research ___ Teaching ___ Administrative ___ Extension

APPENDIX D
Tables from Survey of IFAS Teaching, Extension, Research, and Administrative Activities

Table 1.

Use of Distance Education by Function

Function	Number of courses, programs/activities
Teaching	30 separate courses (Includes 3 cross-over courses for extension purposes.)
Extension	24 (Includes workshops)
Administration	2
Research	3

Table 2.

Distance Education Program Offerings

Type of program	Total
Academic course	30
Workshops/credit (CEUs) & noncredit	17
In-service (IFAS county faculty)	9

Table 3.

Years Courses Could be Ready

Year Available	Total Ready
Currently available	10
Academic Year 1996-97	12
Academic Year 1997-98	2

Table 4.

Identified Audiences for Distance Education Programs

Audience	Total
Undergraduates	16
Graduate students	5
County/Extension faculty	17
Other (including agriculture, environmental, teachers, government employees)	39

Table 5.

Educational Needs for Faculty Members Delivering Content via Distance Education

Identified Needs	Total responses
Funding for materials and visual aids	36
Faculty training to use distance education technologies	29
Assistance w/ instructional design	20
Release time	18
Technical support	8

Table 6.

All Technological Tools/ Media to Deliver Education

Medium	Total
Satellite	20
Videotapes	17
Two-way audio/video	13
CD-ROM	13
WorldWide Web/Internet	20
Audioconference	3
Other (printed materials)	4

Table 7.

Comparison of Medium with *Teaching* Function

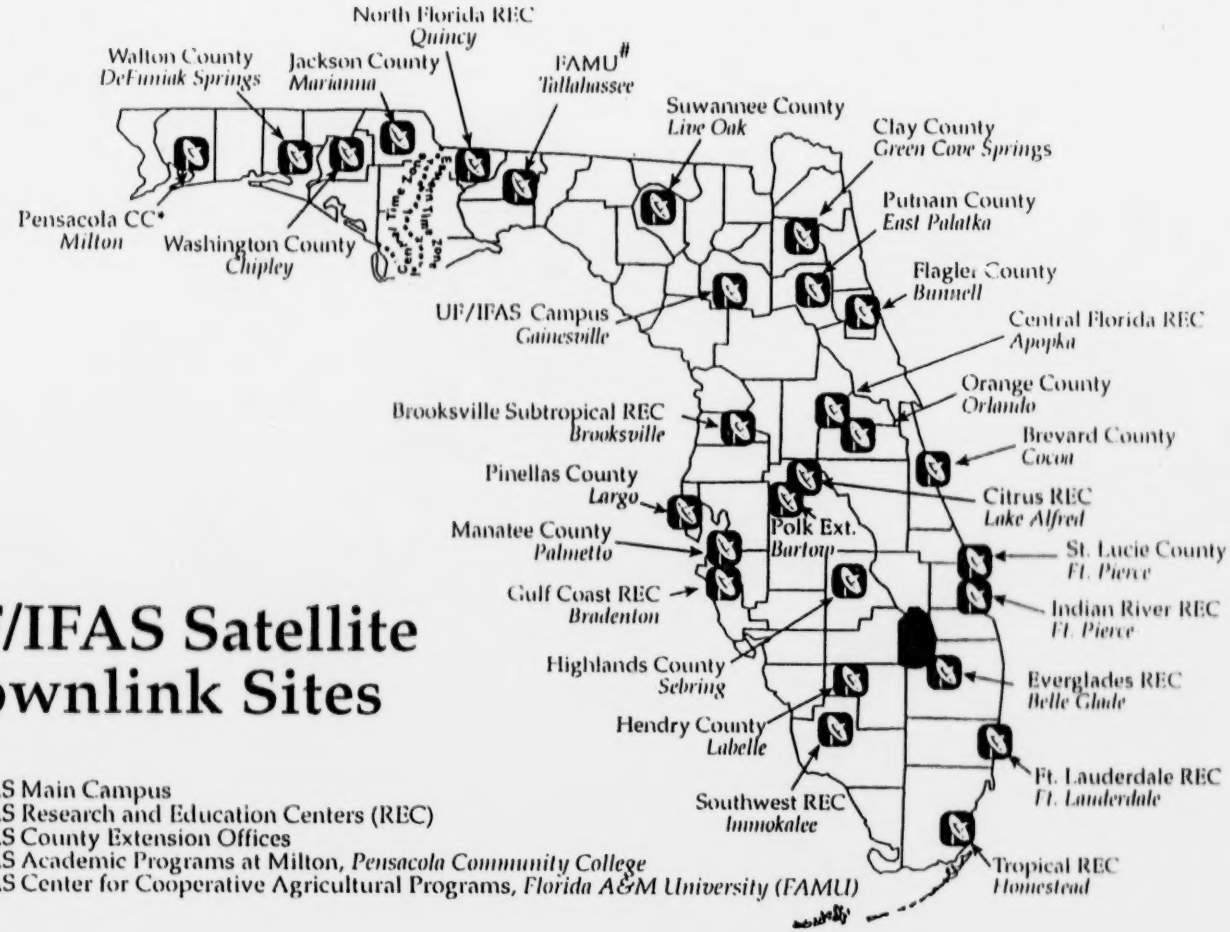
Medium	Total
Satellite	9
Videotape	13
Two-way audio/video	3
CD-ROM	4
WorldWide Web/Internet	3
Audiconferencing	1
Other (printed materials)	2

Table 8.

Comparison of

Medium with *Extension* Function

Medium	Total
Satellite	10
Videotape	5
Two-way audio/video	8
CD-ROM	7
WorldWide Web/Internet	11
Audiconferencing	1
Other (printed materials)	2



UF/IFAS Satellite Downlink Sites

UF/IFAS Main Campus
UF/IFAS Research and Education Centers (REC)
UF/IFAS County Extension Offices
* UF/IFAS Academic Programs at Milton, *Pensacola Community College*
# UF/IFAS Center for Cooperative Agricultural Programs, *Florida A&M University (FAMU)*

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